

Students Perception of Digital Badging in Higher Education a Qualitative Case Study

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Table of Contents

Chapter 1- Introduction.....	Page 3
Introduction.....	Page 3
Statement of the Problem.....	Page 4
Purpose.....	Page 4
Research Questions.....	Page 5
Limitation.....	Page 5
Delimitation.....	Page 6
Assumptions.....	Page 6
Chapter 2: Literature Review.....	Page 7
Introduction.....	Page 7
Support Services in Higher Education.....	Page 8
Motivation.....	Page 8
Micro-credentialing and Professional Development	Page 9
Course-based and Program Initiatives.....	Page 9
Summary.....	Page 10
Chapter 3: Methodology.....	Page 11
Introduction.....	Page 11
Research Design.....	Page 11
Population and Sample.....	Page 12
Researchers Position.....	Page 13
Procedure.....	Page 13
References.....	Page 16
Appendix A.....	Page 21
Appendix B.....	Page 22
Appendix C.....	Page 23
Appendix D.....	Page 24

Chapter 1: Introduction

Introduction

Gamification has been implemented within higher educational institutions to appeal to students and promote engagement. Digital badging is a form of gamification, which has become increasingly popular in higher educational institutions. Digital badges are symbols or indicators of an accomplishment, skill, quality, or interest (Dyjur & Lindstrom, 2017). Digital badges have been used in higher education to promote engagement, motivation, and goal setting. Embedded in each badge is metadata, which provides information about the issuing institution's name, the date issued, and criteria for earning the badge (Fields, 2015). Using digital badges allows students to see visual documentation of achievement, which can be displayed on social media and professional platforms.

Supporting first-year students in the transition to higher education has been a significant issue for higher education institutions to enhance student retention. Personal and adaptive academic support services should be offered to meet students' individual needs (Schumacher & Ifenthaler, 2018). Digital badging has been suggested to improve academic requirements to help students better adapt to higher education demands. Higher educational institutions have implemented digital badging into various programs such as first-year experience, career courses, and mentoring programs. However, one-third of the students still withdraw from the institution before degree completion (Mah & Ifenthaler, 2019). Research indicates the need for further research to determine student perception towards digital badging and its impacts on self-esteem and goal setting.

Statement of the Problem

Higher educational institutions have attempted to address low student engagement and career readiness using first-year experience courses, which have been unsuccessful. Overcoming the unique challenges higher educational institutions face involves identifying and addressing the many obstacles' students encounter by implementing innovative learning technologies. The emergence of new teaching and learning models has encouraged educators to adapt to learners' needs to create conditions suitable for developing more motivating and innovative practices (Campillo-Ferrer et al., 2020). Digital badging is a form of gamification, a motivational strategy that educators employ to improve student engagement and academic performance (Kim et al., 2018). Digital badging has been used in educational and career planning courses to enhance student experiences. Although researchers have studied the motivational impact of digital badging on students in higher educational institutions, there is a lack of research exploring STEM students' experiences using digital badging who have difficulty with self-esteem and goal setting.

Purpose

This qualitative study aims to explore student's perceptions towards digital badging. The researcher will collect data from college-level STEM students who have earned digital badging during their sophomore and junior years. The study will examine if students' who earn digital badging show improved self-esteem and goal setting. This study will investigate whether or not acquiring digital badges has improved student's confidence in approaching STEM faculty members. Finally, the study will investigate if STEM students with digital badges feel more confident when applying for internal and external internships.

Research Questions

The researcher will investigate student's perception towards digital badging using the following research questions to guide this qualitative study:

R1: What are STEM students' perceptions towards digital badges?

R2: How do STEM students feel digital badging has impacted their self-esteem and goal setting?

A. Did acquiring digital badges improve confidence in approaching STEM faculty members?

B. What is the confidence level of STEM students when applying for internal and external internships?

Limitations

This study will not be representative of the whole STEM student population due to the fact not all STEM students earn digital badges. Researchers' subjective feelings and biases may influence the case study. The data collection methods used in this study, such as observations, interviews, and records, can be time-consuming and challenging to collect due to participants' availability and willingness. The study may also be difficult to replicate if the sample population is specific to a higher educational institution. This case study focuses on only one group of STEM students, which does not mean it represents the broader body of comparable cases. The conclusions drawn from this particular case study may not be transferable to other higher educational settings.

Delimitations

This study was chosen because of the researcher's interest in student experiences with digital badging. The researcher is interested in identifying students' perceptions and attitudes who earn badges and whether or not digital badges can significantly improve self-esteem and goal setting. This study's participation will be limited to the STEM student population experiences due to reduced research available on this particular population of students. This study will not analyze measurable data such as grade point average or the number of earned badges. This study will not measure whether students secured internal and external internships as it is not directly related to the students' experience with digital badging.

Assumptions

The participants will answer honestly and truthfully during interviews. The researcher assumes that the data collected from student responses in interviews will directly correlate with the researcher's observations. The participants have a genuine interest in participating in the case study and do not have any other motives and are not receiving any monetary or academic incentive. The sample selection criteria are appropriate and, therefore, assure that the participants have all experienced digital badging as it relates to the study. The data will support that college STEM students' digital badge experiences have an improved impact on self-esteem and goal setting.

Chapter 2: Literature Review

Introduction

Digital badging has become an emerging trend in higher educational institutions. Digital badging provides students a way to recognize various academic and career-oriented skills. While digital badging has become increasingly popular, research continues to ensure proper implementation and its effects on students' perceptions. Analyzing the different factors impacting performance and adoption into the curriculum could better help understand students' unique experiences related to badge implementation and establish consistency among badge design standards. (Stefaniak & Carey 2019).

This literature review will focus on the implementation and digital badging experiences of students in higher education. Student support services in higher education have implemented various gamification strategies, such as digital badging. Research shows digital badging improves student motivation, engagement, self-esteem, and goal setting. Hamari (2017) suggests that completion of goals leads to increased student satisfaction and increased student performance, especially if goals are context-related, immediate, and the users receive instant feedback. Digital badging has been seen as an opportunity by students to earn micro-credentials and professional development opportunities for academic and career goals. Educational technologies for learning and teaching in higher education, such as learning analytics, have become more established and are essential drivers in changing learning and teaching environments (Mah & Ifenthaler, 2019). Course-based programs and initiatives have implemented digital badging to improve student's college experiences.

Support Services in Higher Education

Higher educational institutions are looking to support students to better adapt to higher education demands. Digital badges facilitate student communication and retention improvement and serve as an indicator for students' needing additional academic support services. Offering institutional support services is very important for students to have a pleasurable college experience. Institutions work to provide support services such as digital badging in summer bridge programs, first-year experience courses, and mentoring programs. However, academic support services offered vary by institutions. Information should be shared with students about support services and digital badging programs through information events, advertisements, networks, and improved communication that may help students utilize these support services (Mah and Ifenthaler, 2018). Implementing digital badging into student support services might be more successful as an integrated part of the student college experience. Students face many challenges, including academic transition, a social transition, and meeting expectations and perceptions (Mah & Ifenthaler, 2019). Educational support services and the concept of digital badges are a technique to address students' needs in higher education.

Motivation

Gamification is an approach that has been implemented in higher education to increase engagement which incorporates game elements into an educational setting (Dichev & Dicheva 2017). The effects of the game elements found in digital badging stimulate students. The success of gamification depends primarily on motivation (Kim et al., 2018), which drives goal-directed behaviors (Stieglitz et al., 2017). Two types of motivation include intrinsic, which comes from within the player, or extrinsic, caused by an external factor outside the individual (Stieglitz et al., 2017). Digital badges use points and a leaderboard; this game element motivates students to

push themselves to the top and compete with their peers. Research indicates that leaderboards encourage goal-setting behaviors by motivating players to create performance goals that will help them reach the top of the leaderboard (Landers et al., 2017). Achievement goal theory is a theory of motivation that suggests people's desire to accomplish goals can drive their motivation (Kim et al., 2018). By implementing gamification using digital badging into higher educational institutions, students can improve specific behaviors and skills to reach desired outcomes.

Micro-credentialing and Professional Development

Digital badging is an opportunity for students and employees to earn micro-credentialing and professional development. Virtual digital badging systems allow students and employees to display their achievements and skills. Micro-credentials are appealing to students since they can earn badges through gamification (Mathur et al., 2018). Micro-credentialing programs are prevalent and acknowledged by students, faculty, and employers. Students have stated benefits to micro-credentials; digital badges assist in goal setting and career preparation. Students build digital portfolios and use them to apply for internships and job searches. Digital badges are easily shared through social media and professional networking platforms. Additional research will inform us if students with extensive digital portfolios experience greater success during their academic training, gaining employment, and achieving success on the job (Mathur et al., 2018). Digital badges offer an engaging and fun way to earn micro-credentials and complete professional development, improving goal setting.

Course-based Programs and Initiatives

Digital badging has been implemented into credit-based courses and various program initiatives throughout college campuses. As an innovative form of education certification, a digital badge is an online assessment and accreditation mechanism (Grant, 2016). Badges are

used in both face-to-face courses as well as online courses. Many institutions have implemented badging to identify students who qualify for specific mentoring and internship programs. Students and faculty members see the value of badges both inside and outside the classroom. Applying digital badging allows students to document professional development and assist in outreach and marketing activities (Stefaniak & Carey 2019). Digital badging can help employers identify potential candidates for internship and employment opportunities. Badges support traditional degree programs and link badge earners to possible employers and professional organizations (Wilson et al., 2016). Digital badges are an example of informal learning, which can help students experience better learning outcomes and improve academic and career goal setting.

Summary

This literature review has focused on research supporting the need, implementation and experiences of digital badging in higher education. Higher educational institutions continue to look for strategies to implement gamification into student support services. The implementation of digital badging improves student motivation, engagement, self-esteem, and goal setting. Digital badging offers students the opportunity to earn micro-credentials and participate in professional development opportunities, helping them reach academic and career goals. The implementation of digital badging in course-based programs and initiatives has shown to positively impact students' college experiences. Further research is needed to explore STEM student perceptions and experiences digital badging has on self-esteem and goal setting.

Chapter 3: Methodology

Introduction

Gamification is used in K-16 classrooms around the world. Digital badging is a growing trend in higher education institutions that foster student engagement and participation. The utilization of digital badges is recommended not only as a credentialing instrument but as an assessment tool in higher education (Zhou et al., 2019). Digital badges are considered a powerful, positive tool used to motivate students (Abramovich & Wardrip, 2016). Digital badges can provide students with the support and structure to successfully navigate their higher educational experience.

The purpose of this research is to explore STEM student's perception of digital badging in higher education. The researcher has chosen a qualitative approach for this study because of its effectiveness in exploring individuals' perceptions of their experiences (Denzin & Lincoln, 2013). The purpose of qualitative research is to develop a thorough understanding of a research topic. Qualitative analysis allows for the researcher to explore students' thoughts and feelings.

Research Design

For this study, the researcher will follow a qualitative case study research methodology using multiple data collection methods. A case study is a form of qualitative inquiry best suited for comprehensively exploring a complex issue in context (Yin, 2014). Creswell and Guetterman (2019) state that an instrumental case study provides insight into a problem or theme. This instrumental case study involves collecting detailed information using multiple data collection approaches to explore students' perceptions of digital badging and the impact it has on self-esteem and goal setting. Using various sources of data ensures the strength of a case study (Yin, 2014). The researcher will collect data from STEM students who have earned digital badges and

focus on gaining information regarding their experience using observations, interviews, and reports.

This study aims to explore STEM student's perception of digital badging and will answer the following questions:

R1: What are STEM students' perceptions towards digital badges?

R2: How do STEM students feel digital badging has impacted their self-esteem and goal setting?

A. Did acquiring digital badges improve confidence in approaching STEM faculty members?

B. What is the confidence level of STEM students when applying for internal and external internships?

The researcher will be an active participant in the qualitative case study. The case study methodology will allow the researcher to gain an understanding of this issue in its natural setting. This case study is bound to time, location and activity. The researcher is focusing on STEM students who have earned digital badges during their sophomore and junior years. The researcher will conduct observations as a non-participant of students earning digital badges. Data collection will allow for a deep understanding of the activity and student experience. The researcher will collect data from the observations, interviews, and reports to complete a data analysis identifying emergent themes. The data collected from this study will help understand students' perception of digital badging and a deep understanding of its impact in higher educational institutions.

Population and Sample

The researcher selected STEM students who have earned digital badges enrolled at New Jersey City University. The criteria for selecting participants will be based on whether they were STEM students who earned a digital badge. This study's target population is STEM students

who have earned digital badges during their sophomore and junior years attending college.

Convenience sampling will be used based on participants' convenience and availability (Creswell & Guetterman, 2019). The researcher will request from the administration to identify students who meet the criteria (Appendix A).

Researcher's Position

The researcher will be an active participant in the qualitative case study. The researcher is an adjunct professor in the biology department and works directly with the university's STEM student population. The researcher also works for the Title III Part F HSI-STEM grant and the Title V DHHS grant as the grant administrator, supporting STEM students' initiatives at the university. The researcher is an employee of the university for the last four years. During the past four years, the researcher has been involved in managing various STEM initiatives, including STEM bridge programs, mentoring, and internship programs. The researcher's participation and close work with the STEM student population may influence the interpretation of the data collected. The researcher is a former STEM alumnus and will cause bias. The researcher is familiar with the research topic and has opinions regarding the research topic.

Procedure

This study will use a qualitative instrumental case study approach to explore STEM student's perception towards digital badging in higher education. This study's procedure will seek permissions and approvals, collect data from participants, analyze data, and report findings. The researcher will begin by obtaining Institutional Review Board (IRB) consent. Once the IRB has granted permission, the researcher will request approval from the administration before collecting data (Appendix B). Once the administration authorizes the study and provides the list of STEM students who have earned digital badges, the researcher will send out an email

(Appendix A) explaining the study and inviting them to participate and complete the consent form. The email will be distributed at the beginning of the spring semester, with a request to complete the consent form within 10-days. The researcher should have ample time to collect a sample of students who would like to participate in interviews and observations. After the deadline has passed and participation is low, there will be a reminder and extension granted to recruit additional participants. Once the researcher has at least 20-30 participants signed up for interviews and observations, data collection can begin.

The researcher will conduct observations with students who are earning digital badges. The researcher and participants will agree the observation will take place for the entire duration of module completion. The digital badging system works at the participant's pace and will agree to complete the module in one sitting for the observation. The researcher will focus on the participants' behavior and reactions while completing the module using the observation checklist (Appendix C). The researcher will take field notes and will not use video or audio recordings.

The researcher will conduct interviews primarily consisting of open-ended questions (Appendix D). This approach aims to reveal information about the participants' experiences with digital badging and what motivated them to participate in the activity. Qualitative interviews provide detailed, in-depth descriptions of the study topic, which allow readers to decide the transferability of the outcomes (Merriam, 2002). The researcher will take minimal notes during the interviews and video and audio record to stay engaged with the participant. Consent is requested to video and audio record these sessions in the emailed consent form.

The researcher will review relevant documents regarding participants' who used gamification and earned digital badges. The review includes the digital badging system, module instructions, rules, and game element props such as leaderboards. These documents will provide

the researcher understanding of how and why the participants used digital badging (Patton, 2015). The researcher will begin data analysis once interviews have started to complete the research promptly. The researcher will use the data collected in the interviews to triangulate information collected from other approaches, which improves the credibility of research findings (Merriam, 2002). Data coding will be used to identify emerging themes from the observations, interviews, and documents collected. The analysis of the data will answer the research questions that guide this quantitative study:

R1: What are STEM students' perceptions towards digital badges?

R2: How do STEM students feel digital badging has impacted their self-esteem and goal setting?

A. Did acquiring digital badges improve confidence in approaching STEM faculty members?

B. What is the confidence level of STEM students when applying for internal and external internships?

The researcher will use the data analysis to report emergent themes and results which will guide future research.

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Appendix A: Student Recruitment Letter

July 10, 2021

Dear Students,

NJCU has implemented the use of a digital badging system. There has been an increase and interest in research regarding the implementation of digital badging and student experiences. As a result, I will be conducting a study that aims to explore STEM students' perception towards digital badging and any impacts earning digital badges has made, particularly on students' self-esteem and goal setting.

Participation in this study is voluntary and anonymous. By completing the online consent form, you agree to participate in an observation or interview and allow us to use the data collected in this study. **Please complete the consent form by April 15, 2021, to be eligible to participate.**

If you have any concerns or questions, feel free to contact me by email or phone. You can also contact Dr. Christopher Carnahan at ccarnahan@njcu.edu or the NJCU Institutional Review Board.

Sincerely,

Kristina Harb

Proyecto STEM, Grant Assistant

New Jersey City University

Email: khARB@njcu.edu

Office: 201-200-2143

Appendix B: Letter to Administration

July 10, 2021

Dear Administrator,

My name is Kristina Harb, and I am the Proyecto STEM Grant Assistant and a doctoral student in the Educational Technology Leadership Program at New Jersey City University. There has been an increase and interest in research regarding the implementation of digital badging and student experiences. I am seeking your permission to conduct a study with NJCU STEM students who have earned digital badges. The study explores STEM students' perception of digital badging and any impacts earning digital badges has made, particularly on students' self-esteem and goal setting.

Student participation in this study is voluntary and anonymous. I would only need the list of STEM students and their email addresses to distribute the consent form. I have included the student recruitment email used to invite students to participate and the consent form for your reference.

If you have any concerns or questions, feel free to contact me by email or phone. You can also contact Dr. Christopher Carnahan at ccarnahan@njcu.edu.

Sincerely,

Kristina Harb

Proyecto STEM, Grant Assistant

New Jersey City University

Email: kharb@njcu.edu

Office: 201-200-2143

Appendix C: Observation Checklist

Checklist of Items in Observations

- What behaviors is the student displaying?
- Does the student understand the instructions?
- What is the student's level of focus?
- What is the student's level of comfort?
- Does the student display any facial expressions?
- Did the student earn the digital badge or gave up?
- Did the student have difficulty navigating the digital badging system?

Appendix D: Interview Questions

1. Introduction

- a. What is your academic standing at NJCU?
- b. What is your major?
- c. How long have you been using digital badging?

2. Research Question 1: What are STEM students' perceptions towards digital badges?

- a. What motivated you to earn a digital badge?
- b. What were some of the benefits you have experienced due to earning a digital badge(s)?
- c. Why would you recommend digital badging to your peers?

3. Research Question 2: How do STEM students feel digital badging has impacted their self-esteem and goal setting?

- a. **Did acquiring digital badges improve confidence in approaching STEM faculty members?**
 - i. How often do you find yourself approaching STEM faculty?
 - ii. How has your self-esteem been improved when you approach STEM faculty?
- b. **What is the confidence level of STEM students when applying for internal and external internships?**
 - i. How often have do you apply for internal and external internships?
 - ii. What do you feel digital badging has contributed when it comes to applying for internships and goal setting?